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Tax policy and the labor market: A sensitivity analysis with an AGE model

Ate Nieuwenhuis and Jan Boone

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CPB Netherlands Bureau for Economic Policy Analysis
Van Stolkweg 14
P.O. Box 80510
2508 GM The Hague, The Netherlands

Telephone +31 70 33 83 380
Telefax +31 70 33 83 350

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1 Introduction

CPB's applied general-equilibrium model MIMIC (Gelauff and Graafland, 1994) focuses on how the tax and social-security system (TSSS) impacts the labor market. In recent years, numerous proposals for changing the TSSS have been analysed with the model to inform policy makers on their likely effects. The way unemployment was affected always played an important part in the decisions on actual reform, because combatting unemployment was high on the political agenda.

Recently, a revised version of the model has become operational; for a description, see Graafland and De Mooij (1998). Some parts of the model have been changed on the basis of recent empirical research; for example, new MIMIC features much higher export price elasticities, much lower substitution elasticities between capital and labor, and a new wage bargaining model. Moreover, the model has been extended in several ways in order to better describe the distortions that come with high marginal taxes; for example, new MIMIC takes account of the informal economy and of schooling by employers and employees. Typically, the empirical base for these new parts is relatively weak.

This paper explores how sensitive new MIMIC's results are to a number of parameter changes, concentrating on recent modifications of and additions to the model. In assessing the robustness of the results it pays special attention to the ranking of measures in terms of their efficacy in reducing (unskilled) unemployment, like in actual policy debates.

The contents of the paper are as follows. Section 2 is a brief description of MIMIC. It also gives an overview of the parameter variations considered in the sensitivity analysis. Section 3 considers six changes in the TSSS and their effects on a number of macroeconomic variables according to MIMIC. The core of the paper is Section 4, which discusses how these effects change when certain parameters are varied. Section 5 concludes. The appendix consists of tables that tell how the effects of the six measures according to the alternative model versions deviate from MIMIC.

2 Some salient features of MIMIC

2.1 General characteristics

MIMIC uses the applied general-equilibrium methodology. Behavioral equations are derived from microeconomic models of optimizing agents. The model also includes macro links by aggregating individual choices over groups of agents and confronting the results with the behavior of other groups of agents on the goods markets and the labor market. Agents operating on these markets are firms, households and the public sector.

MIMIC is typically a model of a small open economy in the sense that, by assumption, Dutch policies do not affect foreign markets. Foreign products are supplied elastically, so that domestic demand can always be met at unchanged import prices. The value of the guilder is linked to the value of the Deutsche Mark. The domestic real interest rate is exogenous.

MIMIC also comprises some characteristics of New Keynesian Theory. In particular, whereas domestic goods markets clear, the labor market is characterized by equilibrium unemployment. Wages are set by negotiations between firms and households. The resulting wages generally differ from their market clearing levels.

Broadly speaking, MIMIC consists of four submodels which describe, respectively, firm behavior, household behavior, wage formation and the matching process between vacancies and unemployment. These are discussed in the subsections below. Then follow subsections on the public sector, on the data base and calibration, and on the focus of the sensitivity analysis.

2.2 Firm behavior

The business sector is subdivided into six sectors of industry, of which the sheltered sector and the exposed sector are the largest ones. The sheltered sector consists of labor-intensive services facing little competition from abroad. The exposed sector, by contrast, consists mainly of capital-intensive industries subject to fierce competition from abroad. The output market environment of all firms is characterized by monopolistic competition. In particular, firms set their output prices by marking-up marginal cost. Foreign commodities are imperfect substitutes for domestic commodities. This leaves room for a positive mark-up, also in the exposed sector. The terms of trade may change when domestic suppliers adjust their output prices.

Domestic firms maximize profits subject to a CES production function with five factor inputs: intermediate goods, capital (which is immobile between sectors), unskilled labor, low-skilled labor and high-skilled labor. The demand for each factor is positively related to output and negatively to its relative cost. The distinction of several skill levels is important for the analysis of policies targeted at the unskilled, who suffer from a relatively high rate of unemployment. Firms may also hire labor of each skill on the informal market. Furthermore, firms may pay their formally employed workers partly informally ("below the desk"), i.e. by not reporting part of the wages to the tax authority. The volume of this so-called coupled informal labor rises with the marginal tax burden on employers. The marginal tax burden on employers affects also the on-the-job training activities which firms undertake to raise the productivity of their employees. For, if the firm invests in the human capital of its workers, employees may claim part of the returns to these investments in the form of a higher net wage rate. A high marginal tax burden

for the employer makes such wage increases much larger in gross terms. Consequently, the incentives for firms to invest in the human capital of their workers are low when the marginal tax rate is high.

2.3 Household behavior

For an adequate description of labor supply per skill level, MIMIC distinguishes forty types of households. Households are partitioned into couples, single persons, single parents, pensioners and students. People aged between 55 and 65 years form a separate group. Couples consist of a so-called breadwinner (i.e., the individual with the higher personal income) and a partner (the one with the lower personal income). Couples with children are distinguished from those without children. Elder children with an income of their own are classified as single persons. Individuals may differ with respect to their skill level and job status (being employed, receiving some kind of social benefit, or not participating). For each type of household, class-frequency income distributions based on micro data describe the gross incomes of individuals. Application of the relevant statutory tax and premium rates to these gross incomes yields the net incomes and the average and marginal tax rates determining labor supply decisions.

Households apply a stepwise optimization procedure. In the first step, they allocate their incomes optimally to savings and consumption at a given, as yet arbitrary supply of labor. The rate of saving depends on the interest rate and the pure rate of time preference. Consumption is allocated to labor-intensive consumption goods and other goods. Labor-intensive consumption goods can be bought in the formal and in the informal economy; the allocation is governed by the relative price. In the second step, they select the amount of labor supplied from a limited set of discrete options on the labor market. To illustrate, single persons may choose between four options: A full-time job, part-time jobs of 40% or 80%, or a job that amounts to 120% of a full-time job. Breadwinners can choose between 80%, 100% and 120% of a full-time job. Partners may choose between non-participation and a part-time job of 30%, 50% or 80%. In the third step, households allocate total labor supply to the formal labor market and the informal labor market. The participation rate and the number of hours worked in the formal and informal sector depend on the ratio of the net wages on each of these markets. The wage on the informal-labor market follows from the equilibrium condition that demand equals supply.

Households not only supply formal and informal labor, they also produce home goods (which are perfect substitutes for labor-intensive goods) and invest in their human capital. Through acquiring skills, households can either raise their productivity within their own skill group or make their way into a higher skill group. More human capital yields higher wage incomes in the future. This gain is to be weighed against the

opportunity cost of training, measured by current wage income foregone. A simple time-allocation model (see De Mooij, 1997) implies that training activities are proportional to formal labor supply. Intuitively, if labor supply becomes more attractive compared to leisure, also other activities that raise (current or future) labor incomes become more attractive. A higher level of human capital translates into higher labor productivity in the model of the firm.

2.4 Wage formation

Wage formation in MIMIC is described by a bargaining model (see Graafland and Huizinga, 1996). The resulting wage equation implies that gross wages are positively related to the consumer price, the value-added price, and the average tax and premium burden. A higher replacement rate, too, raises gross wages because it raises the threat point income of workers. By contrast, wages decrease with the unemployment rate as it lowers the threat point income of workers. Also the marginal tax rate exerts a negative influence on wages. For a higher marginal tax rate implies that a given gross-wage increase generates a smaller net-income increase, thus shifting the trade-off between employment and gross-wage increases in favor of the former.

The wage equation in MIMIC, though estimated solely on macro data, applies both to the macro wage and to the three skill-specific wages. The macro wage equation features macro values for the average tax burden, the marginal tax burden, the replacement rate and unemployment, whereas skill-specific values are used in the three skill-specific wage equations. For each skill group, the contractual wage rate is the arithmetic average of the macro wage outcome and the skill-specific wage outcome. This specification allows for changing relative contractual wages. The wage structure may be further modified by forces arising in the skill-specific matching process (see the next subsection).

2.5 The matching model

The scarcity on the labor market is related to the mismatch between vacancies and unemployment. Following Pissarides (1990), MIMIC incorporates a market for jobs per skill type. On this market, unemployed people meet firms that search for suitable workers to fill their vacancies. The search strategy of the unemployed is described by two variables, their search intensity and reservation wage. Both variables depend on, among others things, the replacement rate. Specifically, a higher replacement rate reduces the number of job matches because it lowers the search intensity and raises the reservation wage of the unemployed. Accordingly, the mismatch on the labor market exacerbates. Firms may then economize on the costs of finding appropriate employees

by offering an *incidental*[1] wage increase in order to attract sufficient applicants for their vacancies. Equilibrium unemployment goes up.

The search strategy of employers is influenced by the minimum wage. Minimum wages constitute a restriction on the acceptance of unskilled or low-skilled workers as it induces employers to set a minimal-productivity standard for job applicants. Skill-specific distribution functions of (match-specific) worker productivity, based on micro panels of wages, describe the heterogeneity of labor supply within skill groups. A higher minimum wage reduces the number of candidates who meet the minimal-productivity standard, particularly among the unskilled. Hence, vacancy duration will increase, thereby raising the search costs for employers, who then offer incidental wage rises and reduce their labor demand. Once again, equilibrium unemployment goes up.

The matching model distinguishes short-term from long-term unemployment. Because the long-term unemployed have lost part of their skills and because they constitute a very heterogenous group, the distribution function of the productivity of job matches between vacancies and the long-term unemployed features a relatively low mean and a relatively high standard deviation. As a result, the long-term unemployed have a lower probability of meeting the minimal-productivity standard set by employers and, hence, of obtaining a job.

2.6 The public sector

Government behavior is largely exogenous in MIMIC. The model describes several institutional features in great detail, for example the statutory income tax system in the Netherlands as of 1998. The value-added tax (VAT) in the Netherlands consists of a low rate on necessary goods (6% rate) and a high rate for other goods (17½%), next to a number of exemptions (mainly products of the medical sector[2]). Other institutional features in MIMIC are the employers' and employees' social-security contributions, the official minimum wage, several social-benefit schemes and a number of policy instruments targeted at specific groups (for example, the long-term unemployed and the unskilled).

2.7 Data base and calibration

Values of all variables are obtained from various statistical sources (like National Accounts, Labor Force Statistics and micro panels). Most behavioral parameters are

[1] That is, not collectively bargained and agreed upon.

[2] Inclusive of other non-profit enterprises.

taken from the literature. Some parts of the model, like the one for wage formation, are estimated on macro data for the Netherlands. Most elasticities of the firm model are taken from JADE, CPB's new macroeconometric model (see CPB, 1997). The elasticities in the household and matching model are based on microeconometric estimates for the Netherlands reported in the literature. The public sector is based on institutional data with respect to the structure of the TSSS and public outlays. A special-purpose data model forces consistency on the statistical description of the Dutch economy assembled from the various sources. The procedure adopted ensures that MIMIC reproduces the base-year data set.

2.8 Focus of sensitivity analysis

The first column of Table 1 summarizes the values of a number of important parameters in the new version of MIMIC. The other columns report the alternative parameter values considered below. The sensitivity analysis focuses on new elements and on important changes from the previous version of MIMIC (old MIMIC, for short).

In the *first* model variant, S.EXPORT, the partial elasticities of substitution between domestic and foreign goods and services on the export markets have been reduced so as to approximately obtain the price elasticities in old MIMIC, which can be regarded as lower bounds in light of the literature. The values in (new) MIMIC derive from recent research by Draper (1996).

The *second* model variant, S.CAPLAB, raises the elasticities of substitution between capital and labor in the production functions from 0.15 (exposed sector) or 0.0 (other sectors) to 0.75, which seems to be an upperbound in light of the literature. The values in MIMIC derive from recent research by Draper and Manders (1996).

In the *third* model variant, S.SKILLS, the partial elasticities of substitution between unskilled, low-skilled and high-skilled labor have been increased to values which can be regarded as maximum estimates.

In the *fourth* model variant, E.SCHOOL, the marginal-tax rate elasticity of schooling has been halved. There is hardly an empirical base for this parameter. Schooling is absent from old MIMIC.

The *fifth* model variant, S.INF.DEM, raises the partial elasticities of substitution between the demand for formal and informal labor by firms and the demand for formal and informal labor-intensive goods by consumers. Although the empirical base is somewhat stronger than in the former case, here, too, the empirical reliability of the values in MIMIC is rather low. The same holds for the wage elasticities of informal labor supply, which have been doubled in the *sixth* model variant, S.INF.SUP. Old MIMIC does not feature an informal sector.

Table 1 Survey of parameter variations

Model variant	base	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Firm model															
1 S.EXPORT															
S[a] exports of goods	3.0	1.25													
of services	1.75	1.05													
2 S.CAPLAB															
S capital-labor															
exposed sector	0.15		0.75												
sheltered sector	0.0		0.75												
construction	0.0		0.75												
medical sector	0.0		0.75												
3 S.SKILLS															
S between skills															
exposed sector	1.1			2.0											
sheltered sector	2.0			3.0											
construction	2.0			3.0											
medical sector	1.5			2.5											
4 E.SCHOOL															
Marginal-tax rate elasticity															
of schooling by firms	0.2				0.1										
5 S.INF.DEM															
S formal-informal in															
factor demand	2.0					2.5									
Household model															
S formal-informal in															
consumption demand	2.0					2.5									
6 S.INF.SUP															
Wage elasticity informal															
labor supply	0.75						1.5								
7 S.FOR.SUPP															
Wage elasticity formal															
labor supply of partners	1.0							0.5							
8 S.FOR.SUPB															
Wage elasticity formal															
labor supply breadwinners	0.05								0.1						
Wage model															
9 W.EMPL															
Bargaining power employers	0.95									0.9					
10 W.INF															
Weight informal wage															
in threat point	0.06										0.1				
11 W.RPL															
Elasticity of replacement rate	0.25											0.35			
12 W.SPEC															
Degree of skill-specific															
contractual wage formation	0.5												1.0		
Matching model															
13 LU.MEAN															
Mean prod. distr. l.-t. unempl.															
high skilled	0.9													0.8	
low skilled	0.8													0.7	
unskilled	0.8													0.7	
14 LU.SD															
St. dev. prod. distr. l.-t. unempl.															
high skilled	0.2														0.15
low skilled	0.3														0.20
unskilled	0.5														0.25

[a] S denotes a partial elasticity of substitution.

The *seventh* model variant, S.FOR.SUPP, reduces the wage elasticity of formal labor supply by partners to a value that can be regarded as a minimum estimate in light of the empirical literature.

The *eighth* model variant, S.FOR.SUPB, raises the wage elasticity of formal labor supply by breadwinners from 0.05 to 0.10.

The next four model variants all pertain to wage formation, which plays an important part in all results. In the ninth and tenth model variant two structural parameters of the wage bargaining model have been changed substantially; the difference with the base values is more than twice their standard deviations estimated by Graafland and Huizinga (1998). The *ninth* model variant, W.EMPL, lowers the relative bargaining power of employers from 0.95 to 0.90. The *tenth* model variant, W.INF, raises the weight of the informal wage in the threat point of workers from 0.06 to 0.10. These two parameter changes have a strong impact on the (semi-)elasticities of the wage equation. Section 4.4. provides the details.

In the *eleventh* model variant, W.RPL, the elasticity of the replacement rate in the wage equation has been raised to 140% of its base value, which seems a maximum in light of the empirical evidence.

The *twelfth* model variant, W.SPEC, raises the degree to which contractual wage bargaining is skill-specific to its maximum value of one. Here, too, the empirical base of the value chosen for MIMIC is rather weak.

The thirteenth and fourteenth model variant vary the characteristics of the long-term unemployed. In the *thirteenth* model variant, LU.MEAN, skill deterioration due to long-term unemployment has been increased by lowering the mean of the distribution function of the productivity of the (job matches between vacancies and) long-term unemployed (which is normalized to 1 for the short-term unemployed) by 0.1. In the *fourteenth* model variant, LU.SD, the standard deviations of the productivity distributions for the long-term unemployed have been lowered to a lower bound, the corresponding values for the short-term unemployed. The empirical base of the values used in MIMIC for the means and the standard deviations is weak. Old MIMIC does not feature the distinction between short-term and long-term unemployment.

Table 1 documents the actual parameter changes.

3 Six measures: Their effects according to MIMIC

MIMIC is used for the analysis of balanced-budget changes in the TSSS. For practical reasons, the sensitivity analysis in the next section treats only a limited set of six typical measures:

- 1 Lower rate of the first tax bracket (TAX1);
- 2 Lower rate of the third tax bracket (TAX3);

- 3 Higher earned-income tax allowance (EITA);
- 4 Targeted social-security contribution reduction (SSCR);
- 5 Targeted earned-income tax credit (EITC);
- 6 Lower VAT rate.

In all cases, the *ex-ante* reduction of tax revenues equals 0.5 % of GDP. Public consumption is lowered in order to balance the government's budget. Endogenous changes in net tax revenues through behavioral responses of the economic agents are compensated for by additional changes in public consumption so that budget neutrality is maintained.

All six measures impact the economy in the following way. The tax reductions boost real disposable incomes and hence private consumption. Moreover, through their impact on marginal and average gross and net wages and on the replacement rate they affect labor supply, labor demand and the level of equilibrium unemployment. The prices of domestic goods come down. Economic activity goes up, which generates additional tax revenues. Hence, *ex post* the cut-back on public consumption is less than 0.5% of GDP.

This general pattern nonwithstanding, many differences of detail exist. This raises the question how the measures are to be compared. A proper evaluation would account for the gains of private consumption and the losses of leisure and public consumption of the socioeconomic groups discerned in the model; maybe it would even attempt a comprehensive welfare analysis, measuring the net effects of all gains and losses on an index of social performance, like Van Steen (1997) has done with old MIMIC. However, welfare analysis with new MIMIC remains a task for future work. This paper merely presents the long-term effects of the measures on a limited set of macroeconomic variables in *effect matrices* and compares these matrices across model variants. Special attention will be paid to the effects on the unemployment rate, like in actual policy debates.

The five subsections below discuss the effects of the six measures according to the present version of MIMIC. Table 2 is the effect matrix of MIMIC, which will serve as the reference matrix for the other model variants.

3.1 Reducing income tax rates for low and high incomes

A lower marginal tax rate affects labor supply positively through the substitution effect (in MIMIC, through substitution towards options with a larger number of hours supplied). On the other hand, a lower average tax burden affects labor supply negatively through the income effect. Both with a reduction of the tax rate of the first and the third bracket, the aggregate substitution effect dominates the aggregate income effect (see the first two columns of Table 1). Through the substitution effect, a reduction of the tax rate of the first bracket stimulates labor supply by people earning low incomes, mainly to be

found among the unskilled, youngsters (included in the group of single persons when still living with their parents) and particularly partners, many of whom work in part-time jobs. Through the income effect, it reduces the labor supply of breadwinners and older workers, many of whom face the tax rate of the second or third bracket at the margin. The latter effect is smaller than the first one. A reduction of the tax rate of the third bracket, on the contrary, reduces labor supply of many partners through the income effect (net breadwinners' incomes go up) but raises the labor supply of people with high incomes, mainly breadwinners and older workers, through the substitution effect. Although the (uncompensated) wage elasticity of these groups' labor supply is much lower than those of partners', the effect on total labor supply is still sizeable due to the magnitude of the groups affected.

Lower tax rates cause substitution from informal to formal labor, both on the demand side and on the supply side of the labor market. This substitution effect outweighs the positive demand effects resulting from higher production and private consumption. The first measure has a much smaller negative effect on the volume of informal labor than the second one for the following reason. Unlike the second measure, the first one has a rather large positive effect on partners' labor supply. Consequently, household production falls; the compensating increase in the demand for child care and labor-intensive services boosts the demand for informal labor. Therefore, the positive demand effect is relatively large, compensating for a greater part of the negative substitution effect.

Higher net wages raise the gains from training activities like they raise the gains from working. Hence, the time spent on training rises with labor supply. The additional human capital raises labor productivity.

Gross wages fall on impact due to the lower average tax burden. Moreover, the rise in aggregate labor supply strengthens the bargaining position of employers, which creates additional downward pressure on wages. By contrast, the fall of the marginal tax burden raises wages. On net, wages fall (this applies to the other four measures as well).

Lower wage costs lead to lower output prices. As a result, the competitive position of Dutch firms relative to foreign competitors improves, both on domestic and on foreign markets. Exports rise, and the import content of domestic demand declines. Higher real disposable incomes raise private consumption. Output and employment go up, unemployment comes down. *Ex post*, the government must reduce public consumption by only 0.3% of GDP in order to balance its budget.

The first measure favors low-income groups, such as the unskilled, and improves their relative labor market position: The drop in the unskilled gross wage rate exceeds the average drop, the increase of unskilled employment exceeds the average increase, whereas the effects on labor supply do not differ greatly between skill groups (these

Table 2 *Effect matrix of MIMIC*

Measure	1 TAX1	2 TAX3	3 EITA	4 SSCR	5 EITC	6 VAT
Prices			*percentage changes*			
Labor	−0.3	−0.2	−0.5	−1.0	−1.1	−0.1
Value added (enterpr.)	−0.4	−0.3	−0.6	−0.4	−0.6	−0.4
Private consumption	−0.3	−0.2	−0.4	−0.2	−0.4	−0.9
Exports of goods	−0.2	−0.2	−0.3	−0.2	−0.3	−0.2
Informal market	0.8	1.8	0.8	0.6	0.2	0.0
Volumes						
Private consumption	1.2	1.2	1.4	0.8	1.1	1.1
Exports of goods	0.6	0.4	0.9	0.5	0.8	0.4
Value added (enterpr.)	0.7	0.6	1.1	0.5	1.0	0.6
Employment in enterpr.	0.6	0.4	0.8	0.9	1.3	0.4
Labor supply (pers.)	0.1	−0.0	0.3	0.2	0.4	0.0
Labor supply (hours)	0.2	0.2	0.1	−0.2	0.1	0.0
– partners	0.5	−0.4	0.6	0.2	1.2	0.0
Informal labor (hours)	−0.4	−2.1	−0.2	6.2	3.1	−0.4
Human capital (index)	0.1	0.1	0.1	−0.2	−0.2	0.1
Ratios			*absolute changes*			
Unemployment	−0.3	−0.1	−0.5	−0.7	−0.8	−0.2
– unskilled	−0.4	−0.2	−0.8	−3.6	−2.3	−0.4
Replacement rate	−0.1	−0.2	−0.7	−0.5	−1.3	−0.0
Average burden[a]	−0.7	−0.6	−1.0	−0.7	−1.1	−0.1
Marginal burden[a]	−0.7	−2.1	−0.6	2.7	1.5	−0.1
Public consumption[b]	−0.3	−0.3	−0.2	−0.2	−0.2	−0.3

[a] Weighted average of individuals' burdens.

[b] Closure rule, in percentage of GDP.

variables are not shown in the table); hence, the fall of the unskilled unemployment rate exceeds the average fall. The second measure favors high-income groups. Still, also in

this case the fall of the unskilled unemployment rate exceeds the average fall. The reason is completely different, however: A less than average rise of unskilled employment is more than offset by a fall of unskilled labor supply.[3]

3.2 Increasing the earned-income tax allowance

In the Netherlands, the earned-income tax allowance is 12% of gross labor income up to a certain treshold. In 1998, the maximal deduction of about 3,100 guilders is reached at the treshold income of around 26,000 guilders. The third column of Table 1 presents the effects of raising the percentage deduction while maintaining the treshold income. This measure boosts the labor supply of partners because it reduces the marginal tax rate on part-time jobs. Most people with a full-time job, however, earn incomes exceeding the treshold and deduct the maximal allowance. So, whereas their average tax burden diminishes, their marginal tax burden remains the same.

The negative effect on the volume of informal labor is small, as with the first measure. The same explanation applies in both cases.

Benefit recipients do not profit from this measure, only the employed do. Therefore, the replacement rate drops substantially. Moreover, the fall of the average burden is relatively large. Both factors contribute to the large negative effect on wages compared to the first two measures, leading to even lower prices and higher volumes of final demand and output. The unemployment rate goes down by 0.5%-point. The *ex-post* reduction of public consumption is a mere 0.2% of GDP.

In relative terms, low-income groups gain more from the higher allowance than high-income groups do. By consequence, the labor market position of the unskilled improves. Unskilled employment rises so strongly that, in spite of the fact that unskilled labor supply rises more than the average, the unskilled unemployment rate falls by more than the average unemployment rate does.

3.3 Targeted reductions of social-security contributions of employers

The measures considered thus far, as well as the sixth one, apply to all tax payers alike, although some of them may profit more than others do. The measures discussed in this and the next subsection, however, are targeted at low-wage workers. They attempt to

[3] It must be borne in mind that equiproportional changes of the unemployment rates imply a relatively large absolute change of the unskilled unemployment rate simply because it is twice as high as the other rates on the base path.

raise either the demand for or the supply of unskilled labor by targeted reductions of the labor costs for firms or the taxes on low-wage incomes, respectively.

The prevailing system gives employers a rebate on the SSC for workers on low hourly wage rates (the so-called SPAK). The maximal allowance is 3,660 guilders a year for workers at the minimum wage level. The allowance gradually falls to zero for workers earning 115% (121%) of the gross minimum wage at a working time of 36 (38) hours a week. The fourth measure raises the SPAK by 6,000 guilders for a worker at the minimum wage, while the treshold where this additional allowance is zero is 130% of the minimum wage.

As the fourth column of Table 1 shows, the targeted SSC reduction is more effective in fighting unemployment, particularly unskilled unemployment, than the measures discussed above are. The lower labor costs for low-wage workers raise the employment of unskilled persons through two channels. First, they induce firms to substitute unskilled labor for high-skilled labor. Second, they reduce the minimal-productivity standard set by firms, that is the individual productivity below which an unskilled person is not an acceptable candidate for any vacancy posted by firms. So, a larger share of the unskilled unemployed becomes gainfully employable. Moreover, as the net wages of the unskilled rise, the unskilled replacement rate falls; this raises the search intensity of the unskilled and thus improves the efficiency of the job matching process.

However, the targeted SSC reduction has some drawbacks as well. The gradual decline of the tax allowance means that employers face a high marginal tax rate for their low-wage workers. This affects firms' training activities for the unskilled negatively; hence, the productivity of unskilled workers lags behind and less of them are promoted to the rank of the low-skilled. This helps explain why employment rises more than output does (next to substitution from high-skilled to unskilled labor), which is one feature that sets this measure (and the next one) apart from the other four measures. Second, the high marginal tax burden for employers provokes substitution from formal to coupled informal labor. Instead of raising their formal wages, firms may compensate low-wage workers with payments "below the desk", thus not loosing part of the SSC reduction. This substitution towards informal labor explains also why (formal) labor supply measured in hours declines. Third, the reduction of the number of unemployment benefits lags far behind the reduction of the number of unemployed, because low-paid workers are concentrated in the groups of married women and of young single persons, who are generally not entitled to a social benefit. These adverse effects mitigate the favorable effects of the targeted SSC reduction.

3.4 Introducing a targeted earned-income tax credit

The fifth column of Table 2 presents the effects of a targeted earned-income tax credit. Like the targeted SSC reduction, the targeted EITC varies with the hourly wage rate of an employee. The maximal credit applies at the hourly minimum wage; it declines linearly to zero at the minimum wage plus 30%.[4]

Of all measures considered in this paper, the targeted EITC gives the strongest boost to the participation rate: Unskilled and low-skilled partners are stimulated to supply labor as the average tax burden on part-time jobs with low hourly wages drops. However, the effect on hours supplied is rather small for two reasons: Because breadwinners reduce their (formal) supply due to the positive effect on their partners' incomes through the tax credit and the participation rate, and because of substitution towards informal labor (see below).

Targeting the EITC at low-wage workers implies a relatively large fall of the replacement rate and the average tax burden of the unskilled. Through the skill-specific element in wage formation, this translates into a relatively large decline of the unskilled wage rate. Furthermore, the lower replacement rate for unskilled workers raises their search intensity and lowers their reservation wage. Hence, the efficiency of the matching process for unskilled labor improves. Unskilled unemployment drops more substantially than total unemployment does.

The targeted EITC shares several drawbacks with the targeted SSC reduction for employers. Through the higher marginal tax burden, it discourages training efforts by workers and provokes substitution from formal to coupled informal labor.

The targeted EITC is less effective in reducing unskilled unemployment than the targeted SSC reduction for the following reason. A match between a vacancy and an unemployed person may not come about either because the reservation wage exceeds the wage offer or because the unemployed's productivity does not meet the firm's minimal-productivity standard, which is directly related to the total labor costs at the minimum wage level. Both measures raise the efficiency of the matching process for the unskilled because they lower the replacement rate of the unskilled, the targeted EITC even more so than the targeted SSC reduction. However, in most cases where a match does not come about, the blame is on the minimal-productivity standard (see Jongen and Graafland, Table 9). So what matters most is that the targeted EITC does not lower total labor costs at the statutory minimum wage level while the targeted SSC reduction does.

[4] The EITC in the American tax system is related to yearly household wage income.

3.5 Reducing the VAT rate

The sixth measure is a reduction of the VAT rate. Actually, one issue in current policy debates is a shift from direct to indirect taxes. A real-life tax reform may therefore consist of a combination of (minus) this measure with some of the others.

On impact, a lower VAT rate reduces consumer prices, thus raising real disposable incomes. It stimulates labor supply because the substitution effect dominates the income effect. However, since all household types and income groups benefit equally from the fall in the consumer price, the keeping-up-with-the-Jones effect tempers the rise of labor supply; in fact, labor supply hardly changes at all. Many other effects are very similar to those of the first and second measure, a natural exception being the larger fall of the consumer price.

4 Sensitivity analysis

4.1 What information to present?

Parameter changes affect the reduced form of MIMIC and lead to different effect matrices of tax policy variants. However, many changes in effects will not be interesting, because they are small either in absolute terms or in relative terms. The main text focuses on differences in effects that, after rounding, are at least 0.2 in absolute value. When many differences of interest exist, they are presented in the form of a *difference matrix*, that is the difference between the effect matrix of the model variant concerned and that of MIMIC itself. However, in most cases only a single column or row or just a few isolated cells differ significantly (in the sense just defined), so that a verbal description suffices. The reader who wants to judge for himself may consult the appendix, which contains the difference matrices (with their entries rounded to one decimal) of all model variants. The subsections 4.2-5 discuss the difference matrices of the alternative model versions. Subsection 4.6 presents an overview across model variants by comparing the impact of the parameter variations on how (unskilled) unemployment is affected by the six tax changes.

4.2 Elasticities of the model of firm behavior

4.2.1 Export price elasticities (S.EXPORT)

Table 3 is the difference matrix for S.EXPORT, that is the model version with lower substitution elasticities between domestic and foreign goods and services on foreign

markets. The implied export price elasticities go down from 2.7 for goods and 1.6 for services to 1.1 and 0.95, respectively, approximating their values in old MIMIC. Other research (Nieuwenhuis, 1995) has taught that the values of the export price elasticities have a large impact on the model's reduced form. The present results confirm this finding: The difference matrix contains many non-negligible entries. The effects on prices and volumes are intuitive. All measures reduce the wage rate and hence prices. Naturally, the induced export expansions are smaller in S.EXPORT than in MIMIC. Hence, the upward pressure on prices is smaller as well, so that prices fall by more than in MIMIC. This result holds at an unchanged base path. In fact, the change in the export price elasticities leads to a rather different base path, featuring lower unemployment. At a lower level of unemployment, an unemployment fall gives rise to more wage pressure. So, the non-linearity of the wage curve weakens the negative effects on wages and prices at the new base path. The negative effects on output and employment are mitigated as imports, too, fall by more. Only in case of the third measure (higher earned-income tax allowance) is the change in the effects on value added and employment worth mentioning (that is, at the chosen criterium).

The effects on the marginal burden in experiments 2 and 4 and those on the replacement rate in experiments 4 and 5 are caused by compositional effects on employment due to shifts between the exposed and sheltered sectors induced by the lower export price elasticities.

4.2.2 Substitution elasticities between capital and labor (S.CAPLAB)

Raising the partial elasticities of substitution between capital and aggregate labor from 0.15 (exposed sector) or 0.0 (other sectors) to 0.75 hardly affects the effect matrix. All six measures lead to a lower level of investment for S.CAPLAB than for MIMIC, but not in a degree worth mentioning. A greater scope for substitution is not a sufficient reason for substantial substitution to occur, relative factor price change is a necessary condition. As the cumulated share of labor in investment is about 70%, the price ratio of capital and labor does not change by much when the wage rate changes.[5]

[5] However, other measures, for example a reduction of the corporate tax rate, will lead to significantly different outcomes in S.CAPLAB.

Table 3 Difference Matrix for S.EXPORT

Measure	1 TAX1	2 TAX3	3 EITA	4 SSCR	5 EITC	6 VAT
Prices			*percentage changes*			
Labor	−0.3	−0.2	−0.5	−0.5	−0.8	−0.2
Value added (enterpr.)	−0.2		−0.4	−0.3	−0.6	−0.2
Private consumption	−0.2		−0.3	−0.2	−0.4	
Exports of goods	−0.1		−0.2	−0.2	−0.3	
Informal market	−0.4	−0.4	−0.6	−0.4	−0.8	−0.3
Volumes						
Private consumption	−0.2	−0.2	−0.4		−0.3	−0.2
Exports of goods	−0.2	−0.2	−0.3			−0.2
Value added (enterpr.)			−0.2			
Employment in enterpr.			−0.2			
Labor supply (pers.)						
Labor supply (hours)						
− partners						
Informal labor (hours)		0.2		−0.6	−0.3	
Human capital (index)						
Ratios			*absolute changes*			
Unemployment						
− unskilled						
Replacement rate				−0.2	−0.5	
Average burden[a]						
Marginal burden[a]		0.2		0.5		
Public consumption[b]						

[a] Weighted average of individuals' burdens.

[b] Closure rule, in percentage of GDP.

4.2.3 Substitution elasticities between skill classes of labor (S.SKILLS)

Table 4 shows the effects of increasing the (conditional[6]) partial elasticities of substitution between skill types of labor with 1 point (see Table 1 for the exact values). This caused problems with solving the model for the second experiment which are beyond the scope of this paper to discuss.

Higher substitution elasticities mean that firms have more flexibility to react to price changes. Hence, one would expect larger[7] volume effects of price changes. As Table 4 shows, the SSC reduction and EITC experiments, which are targeted at the bottom of the labor market, do actually yield larger falls in the unemployment rate. The bias in the reduction of wages towards the unskilled that characterizes these measures has stronger effects due to the higher substitution elasticities.

At first sight, it seems puzzling that the wage rates fall by more in experiments 4 and 5 due to the higher substitution elasticities. As these elasticities do not affect the employers' fall back position, one would expect the greater flexibility on the employers' side to elicit stronger quantity responses and hence smaller price changes. However, in the base path of S.SKILLS unskilled unemployment is far higher than in the MIMIC base path. So, the non-linearity of the wage curve mentioned in Section 4.2.1 plays a role here, too. At the higher initial unemployment level, a fall in unemployment generates less upward pressure on wages.

Due to the fact that the wage rates fall significantly more (in experiments 4-5) in S.SKILLS than in MIMIC, the other prices fall more as well. Consequently, final-demand expansions are stronger, employment gains are more pronounced and unemployment declines more sharply.

The larger fall in wages makes the formal economy more competitive compared to the informal economy, hence the fall in informal labor.

The stronger fall of the replacement rate with the EITC results from the changed composition of unemployment. The replacement rate is a weighted average of the replacement rates of the different groups of unemployed. The EITC lowers the replacement rate of unskilled labor, which on the new base path has a much larger share of unemployment.

[6] That is, holding aggregate labor constant, rather than output.

[7] Unless of course this higher flexibility caused firms to substitute away completely from a (relatively expensive) production factor. In that case a change in the price of that production factor will cause more substantial changes at the less flexible firm.

Table 4 Difference Matrix for S.SKILLS

Measure	1 TAX1	2 TAX3	3 EITA	4 SSCR	5 EITC	6 VAT
Prices			percentage changes			
Labor		x		−0.3	−0.6	
Value added (enterpr.)				−0.2	−0.5	
Private consumption				−0.2	−0.3	
Exports of goods					−0.3	
Informal market					0.2	
Volumes						
Private consumption				0.2	0.4	
Exports of goods				0.4	0.7	
Value added (enterpr.)			0.2	0.4	0.8	
Employment in enterpr.			0.2	0.6	0.9	
Labor supply (pers.)						
Labor supply (hours)						
− partners			−0.2	0.2	0.2	
Informal labor (hours)				−1.0	−0.3	
Human capital (index)					0.2	
Ratios			*absolute changes*			
Unemployment				−0.3	−0.5	
− unskilled			−0.3	−1.2	−2.2	
Replacement rate					−1.0	
Average burden[a]					−0.2	
Marginal burden[a]					−0.4	
Public consumption[b]		x			0.2	

[a] Weighted average of individuals' burdens.

[b] Closure rule, in percentage of GDP.

4.2.4 Marginal-tax rate elasticity of schooling by firms (E.SCHOOL)

Schooling provided by firms, in particular their efforts aimed at raising the productivity of the unskilled, is adversely affected by the targeted SSC reduction because small net

wage rises require large gross wage rises due to the high marginal tax rate over the interval from 100% to 130% of the statutory minimum wage rate. Empirical knowledge on the marginal-tax rate elasticity of schooling is very scarce indeed. Halving this elasticity reduces the negative effect on the human capital index and hence on productivity by 0.2%; concomitantly, the rise of value added is 0.2% higher than in MIMIC. The other measures do not feature these changes of effects simply because they alter the marginal tax rate to a much lower degree.

4.2.5 Substitution elasticities between formal and informal sector (S.INF.DEM)

This variant combines some parameter changes in the firm model with some in the household model. First, it features higher elasticities of substitution between formal labor and informal coupled labor in the production functions. Second, the elasticities of substitution between formal and informal labor-intensive services in the utility functions are higher as well. The four measures 1, 2, 3 and 6 cause substitution from the informal to the formal economy, the two measures 4 and 5 the other way around. With the higher elasticities of substitution, these effects are larger in absolute value. The entries on the informal-labor row of the difference matrix for S.INF.DEM are −0.2, −0.8, −0.2, 0.3, 0.3 and −0.2, respectively. Because the size of the informal economy is only 3% of the size of the formal economy, a shift from one to the other will generally be large relative to the informal economy but still small relative to the formal economy. This explains why so many entries of the difference matrix are negligibly small.

4.3 Elasticities of the model of household behavior

4.3.1 Wage elasticity of informal labor supply (S.INF.SUP)

Other parameters affecting the trade-off between the formal and the informal economy are the wage elasticities of informal labor supply. In S.INF.SUP, these elasticities are set at twice their values in MIMIC.[8]

Raising the wage elasticities of informal labor supply leads to a larger volume of informal labor in the EITC and SSC reduction experiments as these raise the marginal tax rates substantially in their phase-out ranges. The higher elasticities mean that workers move more readily from formal to informal labor supply in response to the

[8] That is, in the base year 1993. These elasticities are not constant, so there is no guarantee that the ratio of two is maintained over the whole simulation period.

higher marginal tax rates. In the informal-labor row of the difference matrix, the entries in the fourth column (SSC reduction) and fifth column (EITC) are 0.2 and 1.9, respectively. In the EITC experiment, the increase of unskilled informal labor supply is so substantial that unskilled labor supply is reduced here compared to MIMIC. This translates into a larger fall of the unskilled unemployment rate, by 0.4%-point more than in MIMIC.

4.3.2 Wage elasticity of partners' labor supply (S.FOR.SUPP)

Halving the wage elasticities of partners' labor supply leads to an effect matrix with entries smaller in absolute value than for MIMIC on the row for partners' labor supply. The entries of the difference matrix are, respectively, −0.3, 0.2, −0.2, −0.2, −0.6 and 0.0. In case of the EITC experiment, the difference is so large that there are notable differences in the effects on total labor supply, employment and value added as well (down by 0.1-0.2%-point); because the unskilled are overrepresented among partners, the unskilled unemployment rate is further reduced by 0.3%-point compared to MIMIC.

4.3.3 Wage elasticity of breadwinners' labor supply (S.FOR.SUPB)

Not surprisingly, doubling the wage elasticity of breadwinners' labor supply, from 0.05 to 0.10, only affects the TAX3-column of the effect matrix, but even here the differences with MIMIC are small. Labor supply and employment go up by an additional 0.1%. Prices are slightly lower and volumes slightly higher.

4.4 Parameters of the wage model

In MIMIC, like in most macroeconomic models, wage formation is a crucial determinant of many results, and a sensitivity analysis would not be complete if it did not vary the wage equation. MIMIC contains a structural bargaining model that implies an exactly identified wage equation which has been estimated on macroeconomic time series data. Several features of the wage equation are worth mentioning. First, the elasticities of the average and marginal tax rate sum to the elasticity of the consumer price. Second, the elasticities of the consumer price and value-added price sum to one. Third, the bargaining model implies that the elasticities of the replacement rate and unemployment rate are interrelated. The elasticity of the unemployment rate rises towards zero as the replacement rate rises towards one; at low unemployment, the elasticity of the replacement rate is small. Fourth, the wage is proportional to productivity.

The wage equation is non-linear in three structural parameters. The two important ones are the relative bargaining power of employers and the weight of the informal wage in the threat point of workers; for details, see Graafland and Huizinga (1996). Table 5 indicates how the elasticities of the average and marginal tax rate, the consumer price, the value-added price, the replacement rate and the unemployment rate vary with these parameters. The first column of Table 5 presents the parameter estimates of the macro wage equation. At a given marginal tax rate, the average tax rate affects the wage positively: Higher taxes increase the relative attractiveness of working in the informal sector, thereby raising the bargaining position of the worker. By contrast, at a given average tax rate, the marginal tax rate affects the wage negatively, because higher marginal taxes reduce the attractiveness of gross wage increases relative to employment gains for the workers.

Table 5 The wage equation

Model variant	MIMIC	W.EMPL	W.INF
Parameters			
bargaining power employers	0.953	0.9	
weight informal wage	0.06		0.1
Implied elasticities in 1990			
average tax rate	0.67	0.48	0.75
marginal tax rate	−0.12	−0.13	−0.08
consumer price	0.55	0.35	0.67
value-added price	0.45	0.65	0.33
replacement rate	0.37	0.26	0.26
unemployment rate[a]	−2.52	−1.79	−1.83

[a]Semi-elasticity.

Both the relative bargaining power of employers and the weight of the informal wage in the threat point of workers have a very small standard error. Small changes in either of them, as in the second and third column of Table 5, imply rather different values of

the (semi-)elasticities, as appears from the lower part of the table. The sensitivity analysis considers these alternative parameter values as well as alternative values for the elasticity of the replacement rate and the degree of collective wage bargaining.

4.4.1 Bargaining power of employers (W.EMPL)

A smaller relative bargaining power of employers in the wage negotiations, down from 0.95 to 0.90,[9] is equivalent to a larger relative bargaining power of workers. Consequently, the bargaining result is farther removed from the threat point of workers: Wages are higher on the new base path. This leads to higher prices, lower volumes of demand and production, lower employment and higher unemployment rates.

Whereas this parameter change has a large impact on the model's base path, it hardly affects the effects of the six tax policy variants. W.EMPL features a higher elasticity of the value-added price, an unchanged elasticity of the marginal tax rate, and lower elasticities of the remaining variables. Most importantly, the elasticities of the average tax rate and the unemployment rate go down equiproportionally. On impact, a given reduction of the average tax rate lowers wages less in W.EMPL than in MIMIC. However, the counteracting feed-back through lower unemployment is less strong as well.[10]

With the targeted SSC reduction, the negative effects on prices are somewhat larger than for MIMIC. This is due to the non-linearity of the wage equation mentioned before: At higher unemployment rates a given reduction of unemployment generates less wage pressure. Almost all effects on prices and quantities are not worth mentioning. The sole exception is the positive effect on value added, which rises by 0.2%.

With the targeted EITC, the lower elasticities of the average tax burden and the replacement rate explain why wages, especially those of the unskilled, fall by less than in MIMIC.The drop of the unskilled unemployment rate is reduced from 2.3% to 1.4%. The replacement rate ends up 0.2% higher due to the changed composition of unemployment, as a result both of the new base path and of the lower drop of unskilled unemployment.

[9] This change exceeds twice the standard error of the estimate, which is only 0.015.

[10] The model-minded reader is referred to CPB (1997, pp. 14-15) which presents a semi-reduced form equation for the unemployment rate featuring the term $-c \cdot t / d$, where c is the elasticity of the average tax rate t and d is the semi-elasticity of the unemployment rate in the wage equation.

4.4.2 Weight of informal wage in workers' threat point (W.INF)

A larger weight of the informal wage in the threat point of workers, up from 0.06 to 0.10,[11] hardly affects the base path because the relative bargaining power of workers is low. It does affect, however, the elasticities of the wage equation. It reduces the elasticities of the replacement rate and the unemployment rate as the weight of the formal wage is now lower. Moreover, it lowers the elasticity of the marginal tax rate. Most importantly, it raises the ratio of the elasticities of the average tax burden (and the consumer price) and the unemployment rate. Compared to MIMIC, on impact the effect of a given tax reduction is larger, while the counteracting feed-back effects through lower unemployment are less strong. Therefore, the six tax policy measures are more powerfull in W.INF.

Table 6 is the difference matrix for W.INF. The fourth column is lacking because of solution problems for the targeted SSC reduction. The general pattern is larger downward effects on prices and larger upward effects on quantities; the unemployment rate is down by an additional 0.5%-point for the targeted EITC and by 0.2-0.3%-point for the other measures. The targeted EITC is now so effective in boosting production and employment that the measure "pays for itself" through higher tax revenues: Public consumption need not be reduced at all in order to balance the budget.

4.4.3 Elasticity of the replacement rate (W.RPL)

The implemented version of the wage bargaining model features an additional parameter that scales down the elasticity of the replacement rate to about 0.25 in the base version of MIMIC. W.RPL restores the elasticity of the replacement to 0.35, the value implied by the parameter estimates of the wage equation. Naturally, this change affects strongest the effects of the measures 3, 4 and 5, because they alter the replacement rate more than the other measures considered. But even in case of the EITC, which lowers the replacement rate most, there is only one significant element in the difference matrix: The unskilled unemployment rate drops by 0.2% more than in MIMIC.

[11] This change equals twice the standard error of the estimate.

Table 6 Difference matrix for W.INF

Measure	1 TAX1	2 TAX3	3 EITA	4 SSCR	5 EITC	6 VAT
Prices			*percentage changes*			
Labor	−0.2		−0.3	x	−0.4	
Value added (enterpr.)	−0.2	−0.2	−0.3		−0.5	−0.2
Private consumption	−0.2		−0.2		−0.3	
Exports of goods			−0.2		−0.3	
Informal market					0.2	
Volumes						
Private consumption	0.2	0.2	0.3		0.5	0.2
Exports of goods	0.3	0.3	0.5		0.8	0.3
Value added (enterpr.)	0.4	0.4	0.6		0.9	0.4
Employment in enterpr.	0.3	0.3	0.5		0.8	0.3
Labor supply (pers.)						
Labor supply (hours)						
− partners						
Informal labor (hours)					−0.2	
Human capital (index)					0.2	
Ratios			*absolute changes*			
Unemployment	−0.2	−0.2	−0.3		−0.5	−0.2
− unskilled	−0.3	−0.3	−0.5		−1.1	−0.3
Replacement rate						
Average burden[a]			−0.2		−0.3	
Marginal burden[a]			−0.2		−0.3	
Public consumption[b]					0.2	

[a] Weighted average of individuals' burdens.

[b] Closure rule, in percentage of GDP.

4.4.4 Degree of collective wage bargaining (W.SPEC)

As already mentioned in Section 2.4, MIMIC applies the wage equation not only to the macro wage rate but also to the wage rates of the three skill groups and defines each skill group's (contractual) wage as the arithmetic average of the macro result and the

Table 7 Difference Matrix for W.SPEC

Measure	1 TAX1	2 TAX3	3 EITA	4 SSCR	5 EITC	6 VAT
Prices			*percentage changes*			
Labor				−0.2	−0.3	
Value added (enterpr.)				−0.2		
Private consumption						
Exports of goods						
Informal market					0.2	
Volumes						
Private consumption				0.2	0.2	
Exports of goods				0.2	0.2	
Value added (enterpr.)				0.3	0.3	
Employment in enterpr.				0.3	0.4	
Labor supply (pers.)						
Labor supply (hours)						
− partners						
Informal labor (hours)						
Human capital (index)						
Ratios			*absolute changes*			
Unemployment				−0.2	−0.2	
− unskilled			−0.2	−1.0	−2.2	
Replacement rate				−0.2	−0.3	
Average burden[a]						
Marginal burden[a]					−0.3	
Public consumption[b]						

[a] Weighted average of individuals' burdens.

[b] Closure rule, in percentage of GDP.

skill-specific result. W.SPEC eliminates the collective element from wage bargaining, on each submarket is now governed by skill-specific variables (except, of course, for the consumer price and value-added price). A model version with purely collective wage bargaining yields effects opposite in sign but otherwise rather similar to W.SPEC.

Table 7 is the difference matrix for W.SPEC. Quite predictably, the targeted SSC reduction and EITC are now even more effective in reducing (unskilled) unemployment than in MIMIC. Wages (and prices) decline somewhat more strongly, the volumes of private consumption, exports, value added and (unskilled) employment rise somewhat more strongly.

For a long time, wage bargaining in the Netherlands has been strongly centralized. Still, relative wages do have changed. There is little empirical evidence on the strength of skill-specific elements in wage formation. Undoubtedly, however, W.SPEC errs on the strong side. MIMIC would seem to occupy a save middle ground.

4.5 Characteristics of the long-term unemployed

4.5.1 Mean of the productivity distribution (LU.MEAN)

MIMIC assumes that long-term unemployment causes a mean productivity loss of 10% for the high-skilled and of 20% for the unskilled and low-skilled. LU.MEAN raises these average productivity losses to 20%, 30% and 30%, respectively. The difference matrix for this case features four items which are at least 0.2 in absolute value, in the columns 4 (targeted SSC reduction) and 5 (targeted EITC). In particular, informal labor rises by 0.2%-point more compared to MIMIC. Further, these two measures become more effective in reducing unskilled unemployment: With the SSC reduction the difference is -0.5, with the EITC it is -0.2.

The reason why the SSC reduction and EITC become more effective in reducing unskilled unemployment is the following. The greater loss of productivity due to long-term unemployment increases the number of unemployed at the bottom of the labor market, that is precisely where the SSC reduction and EITC are targeted. Naturally, a rise in the number of unemployed at the bottom of the labor market makes these measures more effective.

Note, however, that the size of the productivity loss due to long-term unemployment affects how effective these measures are. To see this, consider the following (extreme) example. If the productivity loss is so great that even the SSC reduction cannot make it profitable for firms to hire long-term unemployed at the minimum wage, this measure becomes less effective instead of more effective in reducing unskilled unemployment. Similarly, with such a productivity loss the EITC may not suffice to offer workers a net

wage above their reservation wage. To summarize, increasing the productivity loss due to long-term unemployment increases the efficacy of SSC and EITC measures up to a certain point, beyond which further productivity losses reduce their efficacy.

The larger effect on informal labor is due to the fact that the reduction in average productivity causes more workers to be affected by the higher marginal tax rates that go with the SSC reduction and the EITC. Hence, more employers and workers face the temptation of demanding or supplying informal labor.[12]

4.5.2 Standard deviation of the productivity distribution (LU.SD)

LU.SD lowers the standard deviations of the log-productivity distributions of the long-term unemployed to those that apply to the labor force at large (see Table 1 for the details). As in the case of the rise of the productivity loss above, a reduction in the spread of the productivity distribution of the long-term unemployed raises the number of individuals in the region affected by the SSC reduction and EITC. Therefore, in these experiments, the unskilled unemployment rate is more reduced than in MIMIC. In particular, the difference in the effect on unskilled unemployment for the SSC reduction is −0.3 (for the EITC, the difference is not worth mentioning). As long as the average productivity of the long-term unemployed lies in the region affected by the SSC reduction and EITC, a reduction in the spread of the productivity loss always raises the efficacy of these measures to combat unskilled unemployment.[13]

4.6 Overview: The effects on (unskilled) unemployment

This subsection provides an overview across model variants. In doing so, it concentrates on differences in the effects on the (unskilled) unemployment rate. The entries of Table 8 and Table 9 are rounded to one decimal; a blank corresponds to 0.0.

Three model variants appear to lead to rather different results for unemployment: S.SKILLS, W.SPEC and W.INF. The analysis confirms the importance of how wage

[12] The distinction between short-term and long-term unemployment is a novel feature of MIMIC that was introduced in order to analyse the effects of vouchers for the long-term unemployed as proposed by Snower (see Jongen and Graafland, 1998). In MIMIC itself, this measure reduces the unskilled wage rate by 1.6%, increases unskilled employment by 6.2%, and lowers the unskilled unemployment rate by 4.2%-point. LU.MEAN reinforces these effects by 2.0%, 3.0% and 2.0%-point, respectively. Most other differences are negligible.

[13] Like a higher mean, a lower standard deviation of the productivity loss raises the efficacy of vouchers to combat unskilled unemployment, but the difference with MIMIC is only 0.3%-point.

Table 8 Survey sensitivity analysis: The effects on unemployment

Measure	1 TAX1	2 TAX3	3 EITA	4 SSCR	5 EITC	6 VAT
Model variant			*absolute changes*			
0 MIMIC	−0.3	−0.1	−0.5	−0.7	−0.8	−0.2
			deviations from MIMIC			
1 EXPORT	0.1		0.1			
2 S.CAPLAB						
3 S.SKILLS		x	−0.1	−0.3	−0.5	
4 E.SCHOOL						
5 S.INF.DEM						
6 S.INF.SUP						
7 S.FOR.SUPP						
8 S.FOR.SUPB						
9 W.EMPL				−0.1		
10 W.INF	−0.2	−0.2	−0.3	x	−0.2	−0.2
11 W.RPL					−0.1	
12 W.SPEC				−0.2	−0.2	
13 LU.MEAN						
14 LU.SD						

[a] Entries less than 0.1 in absolute value (after rounding) have been deleted.

formation is modelled for the simulation results. The largest differences occur with the targeted SSC reduction and EITC. Quite naturally, in case of targeted measures the substitution possibilities between skills impact the outcomes. The other parameter changes considered in this paper do not affect the results for unemployment strongly.

As to wage formation, the estimates of the relative bargaining power of employers and the weight of the informal wage in the threat point of workers have small standard errors and the alternative values considered here are extreme in the sense that they are outside or on the border of the 95%-confidence intervals. The strength of the skill-specific element in wage formation is, however, rather uncertain. Here, too, the alternative considered is extreme. In all three cases, the figures in Tables 8 and 9 indicate what differences may maximally arise. As to substitution between skills,

Table 9 Survey sensitivity analysis: The effects on unskilled unemployment

Measure	1 TAX1	2 TAX3	3 EITA	4 SSCR	5 EITC	6 VAT
Model variant			*absolute changes*			
0 MV10	−0.4	−0.2	−0.8	−3.6	−2.3	−0.4
			deviations from MIMIC[a]			
1 S.EXPORT		0.1	0.1		−0.1	
2 S.CAPLAB						
3 S.SKILLS		x	−0.3	−1.2	−2.2	
4 E.SCHOOL						
5 S.INF.DEM						
6 S.INF.SUP					−0.4	
7 S.FOR.SUPP				−0.1	−0.3	
8 S.FOR.SUPB						
9 W.EMPL			0.1	−0.1	0.4	
10 W.INF	−0.3	−0.3	−0.5	x	−0.6	−0.3
11 W.RPL			−0.1	0.1	−0.2	
12 W.SPEC	−0.1		−0.2	−1.0	−2.2	
13 LU.MEAN	−0.1		−0.1	−0.5	−0.2	
14 LU.SD	−0.1		−0.1	−0.1	−0.1	−0.1

[a] Entries less than 0.1 in absolute value (after rounding) have been deleted.

MIMIC accords with the empirical evidence; the alternative substitution elasticities considered here seem to represent an extreme case.

5 Conclusions

This paper has explored how sensitive new MIMIC's results are to a number of parameter changes. It has concentrated on parameters that have been changed from the previous version of the model, like the export price elasticities and the elasticities of the wage model, and on parameters relating to model extensions, like the incorporation of the informal economy and of schooling provided by firms.

In no case do the parameter variations considered affect the order of efficacy in combatting unemployment. This finding is reassuring, as the predicted effects on unemployment have played an important part in decisions to reform of the tax and social-security system.

Of the fourteen (sets of) parameter variations considered, only two have a strong overall impact on the effects of six typical tax policy measures. These are S.EXPORT, with lower export price elasticities, and W.INF, with a larger weight of the informal wage in the threat point income of workers in wage bargaining. Only in the latter case are the effects on unemployment affected strongly. In both cases, the parameter values of MIMIC are based on recent empirical research.

Two other parameter changes affect strongly the effects of measures targeted at the unskilled. These are S.SKILLS, with larger substitution elasticities between the three skill groups of labor, and W.SPEC, with purely skill-specific wage formation. The parameter uncertainty is greater here.

The remaining parameter variations affect only a few rows or just a few isolated cells of the effect matrix appreciably. Examples are S.CAPLAB, with larger substitution elasticities between capital and labor, which affects the results for investments of all six measures, E.SCHOOL, with a lower marginal-tax rate elasticity of schooling provided by firms, which affects the results for the human capital index and value added, and S.INF.DEM, with larger substitution elasticities between the formal and the informal economy, which affects the prices and volumes in the informal economy.

This paper has considered only a limited set of parameter variations and a limited set of policy measures, and it refrains from jumping to general conclusions. The model user must always bear the uncertainty of the model outcomes in mind. Whenever he feels that the results of a particular policy proposal crucially depend on some parameters, he better perform a sensitivity analysis taylored to the problem at hand.

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Appendix A Difference matrices

Table A.1 Difference Matrix for S.EXPORT

Measure	1 TAX1	2 TAX3	3 EITA	4 SSCR	5 EITC	6 VAT
Prices			*percentage changes*			
Labor	−0.3	−0.2	−0.5	−0.5	−0.8	−0.2
−unskilled	−0.3	−0.1	−0.5	−0.3	−0.6	−0.3
Value added (enterpr.)	−0.2	−0.1	−0.4	−0.3	−0.6	−0.2
Private consumption	−0.2	−0.1	−0.3	−0.2	−0.4	−0.1
Exports of goods	−0.1	−0.1	−0.2	−0.2	−0.3	−0.1
Informal market	−0.4	−0.4	−0.6	−0.4	−0.8	−0.3
Volumes						
Private consumption	−0.2	−0.2	−0.4	−0.1	−0.3	−0.2
Investments	−0.2	−0.2	−0.3	−0.1	−0.1	−0.1
Exports of goods	−0.2	−0.2	−0.3	−0.1	−0.1	−0.2
Value added (enterpr.)	−0.1	−0.1	−0.2		−0.1	−0.1
Employment in enterpr.	−0.1	−0.1	−0.2			−0.1
−unskilled	−0.1	−0.1	−0.1	0.3	0.6	
Labor supply (pers.)						
Labor supply (hours)				0.1		
−unskilled				0.4	0.5	
Informal labor (hours)		0.2	0.1	−0.6	−0.3	
Schooling (index)				−0.1	−0.1	
Ratios			*absolute changes*			
Unemployment	0.1		0.1			
−unskilled		0.1	0.1		−0.1	
Replacement rate				−0.2	−0.5	
Average burden[a]		0.1	0.1	−0.1	−0.1	
Marginal burden[a]		0.2		0.5	0.1	
Public consumption[b]				−0.1		

[a] Weighted average of individuals' burdens.

[b] Closure rule, in percentage of GDP.

Table A.2 Difference Matrix for S.CAPLAB

Measure	1 TAX1	2 TAX3	3 EITA	4 SSCR	5 EITC	6 VAT
Prices			percentage changes			
Labor						
– unskilled						
Value added (enterpr.)						
Private consumption						
Exports of goods						
Informal market						
Volumes						
Private consumption						
Investments	–0.1	–0.1	–0.1	–0.1	–0.1	0.2
Exports of goods						
Value added (enterpr.)						
Employment in enterpr.						
– unskilled					–0.1	–0.1
Labor supply (pers.)						
Labor supply (hours)						
– unskilled						
Informal labor (hours)				0.1		
Schooling (index)						
Ratios			*absolute changes*			
Unemployment						
– unskilled						
Replacement rate						
Average burden[a]						
Marginal burden[a]						
Public consumption[b]						

[a] Weighted average of individuals' burdens.

[b] Closure rule, in percentage of GDP.

Table A.3 Difference Matrix for S.SKILLS

Measure	1 TAX1	2 TAX3	3 EITA	4 SSCR	5 EITC	6 VAT
Prices			percentage changes			
Labor		x	−0.1	−0.3	−0.6	
−unskilled	−0.1		−0.3	−0.5	−1.2	−0.1
Value added (enterpr.)			−0.1	−0.2	−0.5	
Private consumption			−0.1	−0.2	−0.3	
Exports of goods				−0.1	−0.3	
Informal market				0.1	0.2	
Volumes						
Private consumption			0.1	0.2	0.4	
Investments in equipm.			0.1	0.4	0.8	
Exports of goods			0.1	0.4	0.7	
Value added (enterpr.)			0.2	0.4	0.8	
Employment in enterpr.	0.1		0.2	0.6	0.9	
−unskilled	0.1		0.7	3.0	4.5	0.1
Labor supply (pers.)						
Labor supply (hours)				0.1		
−unskilled				0.4	0.4	
Informal labor (hours)	0.1		0.1	−1.0	−0.3	
Schooling (index)				0.1	0.2	
Ratios			*absolute changes*			
Unemployment			−0.1	−0.3	−0.5	
−unskilled			−0.3	−1.2	−2.2	
Replacement rate				−0.1	−1.0	
Average burden[a]				−0.1	−0.2	
Marginal burden[a]			−0.1	−0.1	−0.4	
Public consumption[b]		x		0.1	0.2	

[a] Weighted average of individuals' burdens.

[b] Closure rule, in percentage of GDP.

Table A.4 Difference Matrix for E.SCHOOL

Measure	1 TAX1	2 TAX3	3 EITA	4 SSCR	5 EITC	6 VAT
Prices			percentage changes			
Labor				0.1		
– unskilled				0.8	–0.1	
Value added (enterpr.)				–0.1		
Private consumption						
Exports of goods				–0.1		
Informal market				0.1		
Volumes						
Private consumption				0.1		
Investments				0.1		
Exports of goods				0.1		
Value added (enterpr.)				0.2		
Employment in enterpr.						
– unskilled				–0.2		
Labor supply (pers.)						
Labor supply (hours)						
– unskilled				–0.1		
Informal labor (hours)				0.1		
Schooling (index)				0.2		
Ratios			*absolute changes*			
Unemployment						
– unskilled						
Replacement rate						
Average burden[a]						
Marginal burden[a]				0.1		
Public consumption[b]						

[a] Weighted average of individuals' burdens.

[b] Closure rule, in percentage of GDP.

Table A.5 Difference Matrix for S.INF.DEM

Measure	1 TAX1	2 TAX3	3 EITA	4 SSCR	5 EITC	6 VAT
Prices			percentage changes			
Labor						
– unskilled				0.1	0.1	
Value added (enterpr.)						
Private consumption						
Exports of goods						
Informal market	–0.1		–0.1	–0.1	–0.1	–0.1
Volumes						
Private consumption						
Investments						
Exports of goods						
Value added (enterpr.)						
Employment in enterpr.						
– unskilled						
Labor supply (pers.)						
Labor supply (hours)						
– unskilled						
Informal labor (hours)	–0.2	–0.8	–0.2	0.3	0.3	–0.2
Schooling (index)						
Ratios			*absolute changes*			
Unemployment						
– unskilled						
Replacement rate						
Average burden[a]						
Marginal burden[a]						
Public consumption[b]						

[a] Weighted average of individuals' burdens.

[b] Closure rule, in percentage of GDP.

Table A.6 Difference Matrix for S.INF.SUP

Measure	1 TAX1	2 TAX3	3 EITA	4 SSCR	5 EITC	6 VAT
Prices			percentage changes			
Labor						
– unskilled					0.2	
Value added (enterpr.)						
Private consumption						
Exports of goods						
Informal market		–0.4			–0.6	
Volumes						
Private consumption						
Investments		–0.1				
Exports of goods						
Value added (enterpr.)					–0.1	
Employment in enterpr.					–0.1	
– unskilled					–0.3	
Labor supply (pers.)						
Labor supply (hours)					–0.1	
– unskilled					–1.0	
Informal labor (hours)	–0.1	0.6		0.2	1.9	
Schooling (index)						
Ratios			*absolute changes*			
Unemployment						
– unskilled					–0.4	
Replacement rate					–0.1	
Average burden[a]						
Marginal burden[a]						
Public consumption[b]						

[a] Weighted average of individuals' burdens.

[b] Closure rule, in percentage of GDP.

Table A.7 Difference Matrix for S.FOR.SUPP

Measure	1 TAX1	2 TAX3	3 EITA	4 SSCR	5 EITC	6 VAT
Prices			percentage changes			
Labor					0.1	
– unskilled				0.1	0.4	
Value added (enterpr.)					0.1	
Private consumption						
Exports of goods						
Informal market						
Volumes						
Private consumption					–0.1	
Investments					–0.1	
Exports of goods					–0.1	
Value added (enterpr.)	–0.1	0.1			–0.1	
Employment in enterpr.	–0.1		–0.1		–0.2	
– unskilled	–0.1		–0.1	–0.2	–0.8	
Labor supply (pers.)			–0.1		–0.1	
Labor supply (hours)					–0.1	
– unskilled			–0.1	–0.3	–1.1	
Informal labor (hours)						
Schooling (index)						
Ratios			*absolute changes*			
Unemployment						
– unskilled				–0.1	–0.3	
Replacement rate						
Average burden[a]						
Marginal burden[a]						
Public consumption[b]						

[a] Weighted average of individuals' burdens.

[b] Closure rule, in percentage of GDP.

Table A.8 Difference Matrix for S.FOR.SUPB

Measure	1 TAX1	2 TAX3	3 EITA	4 SSCR	5 EITC	6 VAT
Prices			percentage changes			
Labor						
– unskilled						
Value added (enterpr.)		–0.1				
Private consumption		–0.1				
Exports of goods						
Informal market		–0.1				
Volumes						
Private consumption		0.1				
Investments		0.1				
Exports of goods		0.1				
Value added (enterpr.)		0.1				
Employment in enterpr.		0.1				
– unskilled						
Labor supply (pers.)						
Labor supply (hours)		0.1				
– unskilled					–0.1	
Informal labor (hours)		0.3			–0.2	
Schooling (index)						
Ratios			*absolute changes*			
Unemployment						
– unskilled				–0.1	–0.3	
Replacement rate						
Average burden[a]						
Marginal burden[a]						
Public consumption[b]		0.1				

[a] Weighted average of individuals' burdens.

[b] Closure rule, in percentage of GDP.

Table A.9 Difference Matrix for W.EMPL

Measure	1 TAX1	2 TAX3	3 EITA	4 SSCR	5 EITC	6 VAT
Prices			*percentage changes*			
Labor				−0.1	0.1	
−unskilled			0.1	−0.2	0.7	
Value added (enterpr.)				−0.1		
Private consumption				−0.1		
Exports of goods						
Informal market						
Volumes						
Private consumption				0.1		
Investments		−0.1		0.1		
Exports of goods				0.1		
Value added (enterpr.)				0.2		
Employment in enterpr.				0.1	−0.1	
−unskilled			−0.1	0.1	−1.4	
Labor supply (pers.)						
Labor supply (hours)						
−unskilled				−0.1	−0.1	
Informal labor (hours)				0.1	0.1	
Schooling (index)						
Ratios			*absolute changes*			
Unemployment				−0.1	0.1	
−unskilled			0.1	−0.1	0.9	
Replacement rate				0.1	0.2	
Average burden[a]						
Marginal burden[a]				−0.1	0.1	
Public consumption[b]				0.1		

[a] Weighted average of individuals' burdens.

[b] Closure rule, in percentage of GDP.

Table A.10 Difference Matrix for W.INF

Measure	1 TAX1	2 TAX3	3 EITA	4 SSCR	5 EITC	6 VAT
Prices			*percentage changes*			
Labor	−0.2	−0.1	−0.3	x	−0.4	−0.1
−unskilled	−0.3	−0.3	−0.5		−1.0	−0.3
Value added (enterpr.)	−0.2	−0.2	−0.3		−0.5	−0.2
Private consumption	−0.2	−0.1	−0.2		−0.3	−0.1
Exports of goods	−0.1	−0.1	−0.2		−0.3	−0.1
Informal market	0.1	0.1	0.1		0.2	0.1
Volumes						
Private consumption	0.2	0.2	0.3		0.5	0.2
Investments	0.3	0.2	0.4		0.6	0.2
Exports of goods	0.3	0.3	0.5		0.8	0.3
Value added (enterpr.)	0.4	0.4	0.6		0.9	0.4
Employment in enterpr.	0.3	0.3	0.5		0.8	0.3
−unskilled	0.5	0.4	0.7		1.7	0.4
Labor supply (pers.)						
Labor supply (hours)						
−unskilled						
Informal labor (hours)	−0.1		−0.1		−0.2	−0.1
Schooling (index)	0.1	0.1	0.1		0.2	0.1
Ratios			*absolute changes*			
Unemployment	−0.2	−0.2	−0.3		−0.5	−0.2
−unskilled	−0.3	−0.3	−0.5		−1.1	−0.3
Replacement rate					−0.1	
Average burden[a]	−0.1	−0.1	−0.2		−0.3	−0.1
Marginal burden[a]	−0.1	−0.1	−0.2		−0.3	−0.1
Public consumption[b]	0.1	0.1	0.1		0.2	0.1

[a] Weighted average of individuals' burdens.

[b] Closure rule, in percentage of GDP.

Table A.11 Difference Matrix for W.RPL

Measure	1 TAX1	2 TAX3	3 EITA	4 SSCR	5 EITC	6 VAT
Prices			*percentage changes*			
Labor					−0.1	
−unskilled			−0.1	0.1	−0.2	
Value added (enterpr.)					−0.1	
Private consumption						
Exports of goods						
Informal market						
Volumes						
Private consumption					0.1	
Investments					0.1	
Exports of goods					0.1	
Value added (enterpr.)					0.1	
Employment in enterpr.					0.1	
−unskilled			0.1	−0.1	0.4	
Labor supply (pers.)						
Labor supply (hours)						
−unskilled						
Informal labor (hours)						
Schooling (index)						
Ratios			*absolute changes*			
Unemployment					−0.1	
−unskilled			−0.1	0.1	−0.2	
Replacement rate						
Average burden[a]						
Marginal burden[a]						
Public consumption[b]						

[a] Weighted average of individuals' burdens.

[b] Closure rule, in percentage of GDP.

Table A.12 Difference Matrix for W.SPEC

Measure	1 TAX1	2 TAX3	3 EITA	4 SSCR	5 EITC	6 VAT
Prices			*percentage changes*			
Labor				−0.2	−0.3	
−unskilled			−0.1	−0.8	−1.8	
Value added (enterpr.)				−0.2	−0.1	
Private consumption				−0.1	−0.1	
Exports of goods				−0.1	−0.1	
Informal market				0.1	0.2	
Volumes						
Private consumption				0.2	0.2	
Investments				0.2	0.2	
Exports of goods				0.2	0.2	
Value added (enterpr.)				0.3	0.3	
Employment in enterpr.				0.3	0.4	
−unskilled	0.1		0.2	1.6	3.3	0.1
Labor supply (pers.)						
Labor supply (hours)						
−unskilled					−0.1	
Informal labor (hours)				−0.1	−0.1	
Schooling (index)					0.1	
Ratios			*absolute changes*			
Unemployment				−0.2	−0.2	
−unskilled	−0.1		−0.2	−1.0	−2.2	
Replacement rate				−0.2	−0.3	
Average burden[a]				−0.1	−0.1	
Marginal burden[a]				−0.1	−0.3	
Public consumption[b]				0.1		

[a] Weighted average of individuals' burdens.

[b] Closure rule, in percentage of GDP.

Table A.13 Difference Matrix for LU.MEAN

Measure	1 TAX1	2 TAX3	3 EITA	4 SSCR	5 EITC	6 VAT
Prices			*percentage changes*			
Labor						
– unskilled	–0.1		–0.1	–0.4	–0.3	
Value added (enterpr.)						
Private consumption						
Exports of goods						
Informal market						
Volumes						
Private consumption					–0.1	
Investments						
Exports of goods						
Value added (enterpr.)						
Employment in enterpr.						
– unskilled	0.1		0.2	0.7	0.2	0.1
Labor supply (pers.)						
Labor supply (hours)						
– unskilled				–0.2	–0.2	
Informal labor (hours)				0.2	0.2	
Schooling (index)						
Ratios			*absolute changes*			
Unemployment						
– unskilled	–0.1		–0.1	–0.5	–0.2	
Replacement rate						
Average burden[a]						
Marginal burden[a]					0.1	
Public consumption[b]						

[a] Weighted average of individuals' burdens.

[b] Closure rule, in percentage of GDP.

Table A.14 Difference Matrix for LU.SD

Measure	1 TAX1	2 TAX3	3 EITA	4 SSCR	5 EITC	6 VAT
Prices			*percentage changes*			
Labor						
– unskilled					0.1	
Value added (enterpr.)						
Private consumption						
Exports of goods						
Informal market				0.1	0.1	
Volumes						
Private consumption			0.1	0.1	0.1	
Investments				0.1	0.1	
Exports of goods				0.1	0.1	
Value added (enterpr.)			0.1	0.1	0.1	
Employment in enterpr.				0.1		
– unskilled			0.1	0.4	0.2	
Labor supply (pers.)						
Labor supply (hours)						
– unskilled						
Informal labor (hours)						
Schooling (index)						
Ratios			*absolute changes*			
Unemployment						
– unskilled				– 0.3	– 0.1	
Replacement rate						
Average burden[a]						
Marginal burden[a]						
Public consumption[b]						

[a] Weighted average of individuals' burdens.

[b] Closure rule, in percentage of GDP.

Abstract

CPB's applied general-equilibrium model MIMIC focuses on how the tax and social-security system impacts the labor market. Recently, a (preliminary) new model version has been completed. This paper explores the sensitivity of its results to a number of parameter changes, focusing on new elements and important changes from the previous version, and paying special attention to how the effects on (unskilled) unemployment are affected. The parameters varied include substitution elasticities of the production functions, labor supply elasticities, export price elasticities, coefficients characterizing the wage formation process, and characteristics of the long-term unemployed. Few changes have a strong overall impact on the effects of the (admittedly limited) set of tax changes considered. Usually, the impact is confined to a specific measure or to a small set of variables. In no case is the ranking of the measures in terms of their efficacy in combatting unemployment overturned. Reassuring as this may be, general conclusions cannot be based on the results presented. Sensitivity analysis taylored to the problem at hand must remain a standard element of policy evaluations.